AIRBORNE AVIATION PTY LTD

Aircraft Information Booklet

Cessna 182S

VH-PCO

Last revised: 10 March 2006

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NOTICE

The information and figures contained in this booklet are to be used for general purposes only. This document is not a substitute for the approved aeroplane flight manual.

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Aircraft Overview

This C182S is one of our new generation Cessna's.

It is ideal for advanced flight training (CPL) and CSU endorsements for pilots who are familiar with C172's. With long endurance, big load carrying abilities and a high cruise speed this aircraft is great for cross-country touring.

Equipment & Features

- Dual NAV/COM (One with glide-slope)
- ADF Receiver
- GPS (KLN 89B)
- Transponder
- Dual axis autopilot.
- Leather Seats.

Recency & Restrictions

Private Hire:	100 hours total time, 5 hours on type.
Dual training:	No restrictions.
Recency:	Flown type (or similar) in last 45 days.

Panel Photo

Photo by Sean Maguire – www.already-yesterday.com

Performance – Standard Specifications

SPEED

Maximum at Sea Level ..... 145 KTS

Cruise, 80% Power at 6000 Ft ..... 140 KTS

CRUISE

Using recommended lean mixture with fuel allowance for engine start, taxi, takeoff, climb and 45 minutes reserve.

75% Power at 6000 Ft ..... Range 820NM

88 Gallons Usable Fuel ..... Time 6.05 HRS

RATE OF CLIMB AT SEA LEVEL ..... 924 FPM

SERVICE CEILING ..... 18,100 FT

TAKEOFF PERFORMANCE:

Ground Roll ..... 795 FT

Total Distance Over 50 Ft. Obstacle ..... 1514 FT

LANDING PERFORMANCE:

Ground Roll ..... 590 FT

Total Distance Over 50 Ft. Obstacle ..... 1350 FT

STALL SPEED:

Flaps Up, Power Off ..... 43 KIAS

Flaps Down, Power Off ..... 36 KIAS

MAXIMUM WEIGHT:

Ramp ..... 3110 LBS

Takeoff ..... 3100 LBS

Landing ..... 2950 LBS

STANDARD EMPTY WEIGHT ..... 1925 LBS

MAXIMUM USEFUL LOAD ..... 1185 LBS

BAGGAGE ALLOWANCE ..... 200 LBS

WING LOADING: Lbs/Sq Ft 17.8

POWER LOADING: Lbs/HP 13.5

FUEL CAPACITY ..... 92 GAL

OIL CAPACITY ..... 9 QTS

ENGINE: Textron Lycoming IO-540-AB1A5

230 BHP at 2400 RPM

PROPELLER: Diameter – 3-blade ..... 79 IN

The above performance figures are based on the indicated weights, standard atmospheric conditions, level hard-surface dry runways and no wind. They are calculated values derived from flight tests conducted by the Cessna Aircraft Company under carefully documented conditions and will vary with individual airplanes and numerous other factors affecting flight performance.

Operating Information

AIRSPEEDS - NORMAL OPERATIONS

Takeoff:
- Normal Climb Out ..... 70 – 80 KIAS
- Short Field Takeoff, Flaps 10º, Speed at 50 ft ..... 57 KIAS

Enroute Climb, Flaps Up:
- Normal, sea level ..... 85 – 95 KIAS
- Best Rate-of-Climb, Sea level ..... 80 KIAS
- Best Rate-of-Climb, 10,000 ft ..... 72 KIAS
- Best Angle-of-Climb, Sea level ..... 63 KIAS
- Best Angle-of-Climb, 10,000 ft ..... 66 KIAS

Landing Approach (2950 Lbs):
- Normal Approach Flaps Up ..... 70 – 80 KIAS
- Normal Approach, Flaps FULL ..... 60 – 70 KIAS
- Short Field Approach, Flaps FULL ..... 60 KIAS

Balked Landing (2950 Lbs):
- Maximum Power, Flaps 20º ..... 55 KIAS

V-Speeds:
- Vne (never exceed) ..... 175 KIAS
- Vno (Maximum structural cruising speed) ..... 140 KIAS
- Vfe (Flaps 10°) ..... 110 KIAS
  - (Flaps 20°) ..... 101 KIAS
  - (Flaps 30°) ..... 88 KIAS

Maximum Recommended Turbulent Air Penetration Speed:
- 3100 Lbs ..... 110 KIAS
- 2600 Lbs ..... 101 KIAS
- 2000 lbs ..... 88 KIAS

Maximum Demonstrated Crosswind Velocity:
- Takeoff or landing ..... 15 KNOTS

Stall Speed:
- Flaps Up, Power Off ..... 43 KIAS
- Flaps Down, Power Off ..... 36 KIAS

Unless otherwise noted, the speeds listed above are based on a maximum weight and may be used for any lesser weight. To achieve the performance specified in the performance section for take-off distance of the aircraft approved flight manual, the speed appropriate to the particular weight must be used.

POWER PLANT

Oil Type .....W100 / 15W50
Oil Quantities
Maximum: ..... 9 QTS (Long Flights) / 8 QTS
Minimum: (Company policy) .....5 QTS

Engine operating limits including RPM, pressures, and temperatures, can be found by referring to the green arcs and red lines on applicable gauges.

Detailed information can also be found in the approved flight manual.

FUEL SYSTEM

Total Capacity ..... 350 litres / 92.0 gallons
Total Usable..... 334 litres / 88.0 gallons
Fuel Consumption per hour .....55 litres / 14.5 gallons
Approved Fuels:
Option A .....100LL Grade Aviation Fuel (Blue)
Option B ..... 100 Grade Aviation Fuel (Green)

TYRE PRESSURES

Nose wheel..... 49 PSI
Main wheels..... 42 PSI

MANOEUVRE / LOAD LIMITS

This aeroplane is certified in the normal category. The normal category is applicable to aircraft intended for non-aerobatic operations. These include any manoeuvres incidental to normal flying, stalls (except whip stalls), lazy eights, chandelles, and steep turns in which angle of bank is not more than 60°. Aerobatic manoeuvres, including spins, are NOT approved.

Flight Load Factors:
Flaps Up .....+3.8g, -1.52g
Flaps Down ..... +2.0g

The design load factors are 150% of the above, and in all cases, the structure meets or exceeds design loads.

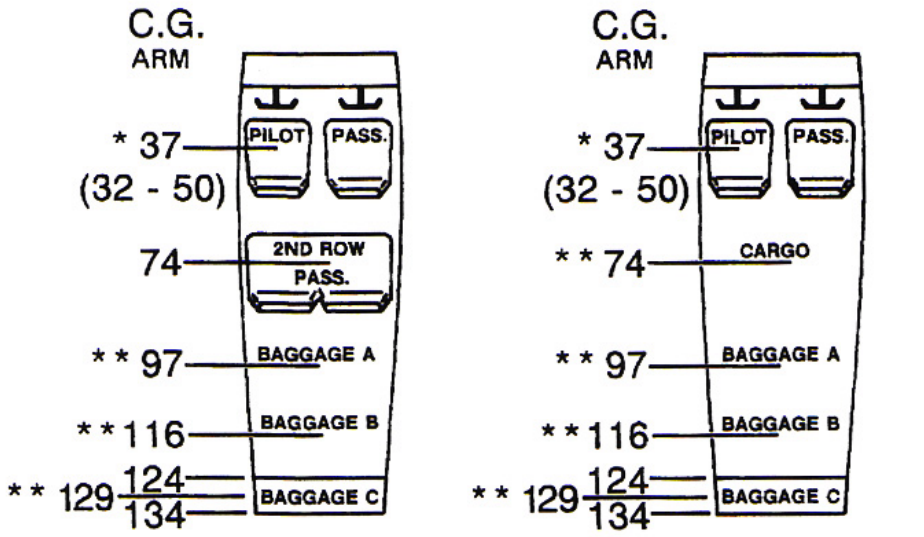
Weight and Balance

ITEM DESCRIPTION	WEIGHT AND MOMENT TABULATION			
	SAMPLE AIRPLANE		YOUR AIRPLANE	
	Weight (lbs.)	Moment (Lb-ins. /1000)	Weight (lbs.)	Moment (Lb-ins. /1000)
1. Basic Empty Weight (Use the data pertaining to your airplane as it is presently equipped. Includes unusable fuel and full oil)	1925	71.9	1960	72.7
2. Usable Fuel (At 6 Lbs./Gal.)				
88 Gallons Maximum	528	24.6		
Reduced Fuel (65 Gallons)				
3. Pilot and Front Passenger (Station 32 to 50)	340	12.6		
4. Second Row Passengers	200	14.8		
Cargo Replacing Second Row Seats (Sta. 65 to 82)				
5. *Baggage Area A (Station 82 to 109; 120 Lbs. Max.)	100	9.7		
6. *Baggage Area B (Station 109 to 124; 80 Lbs. Max.)	17	1.7		
7. *Baggage Area C (Station 124 to 134; 80 Lbs. Max.)				
8. **RAMP WEIGHT AND MOMENT**	**3110**	**135.3**		
9. Fuel allowance for engine start, taxi and runup	-10	-0.5		
10. **TAKEOFF WEIGHT AND MOMENT** (Subtract Step 9 from Step 8)	**3100**	134.8		

11. Locate this point (3100 at 134.8) on the Center of Gravity Moment Envelope, and since this point falls within the envelope, the loading is acceptable, providing that flight time is allowed for fuel burn-off to a maximum of 2950 pounds before landing.

* The maximum allowable combined weight capacity for baggage in areas A, B and C is 200 pounds. The maximum allowable combined weight capacity in areas B and C is 80 pounds.

LOADING ARRANGEMENTS



STANDARD SEATING

2ND ROW SEAT REMOVED

* Pilot or passenger center of gravity on adjustable seats positioned for average occupant. Numbers in parentheses indicate forward and aft limits of occupant center of gravity range.

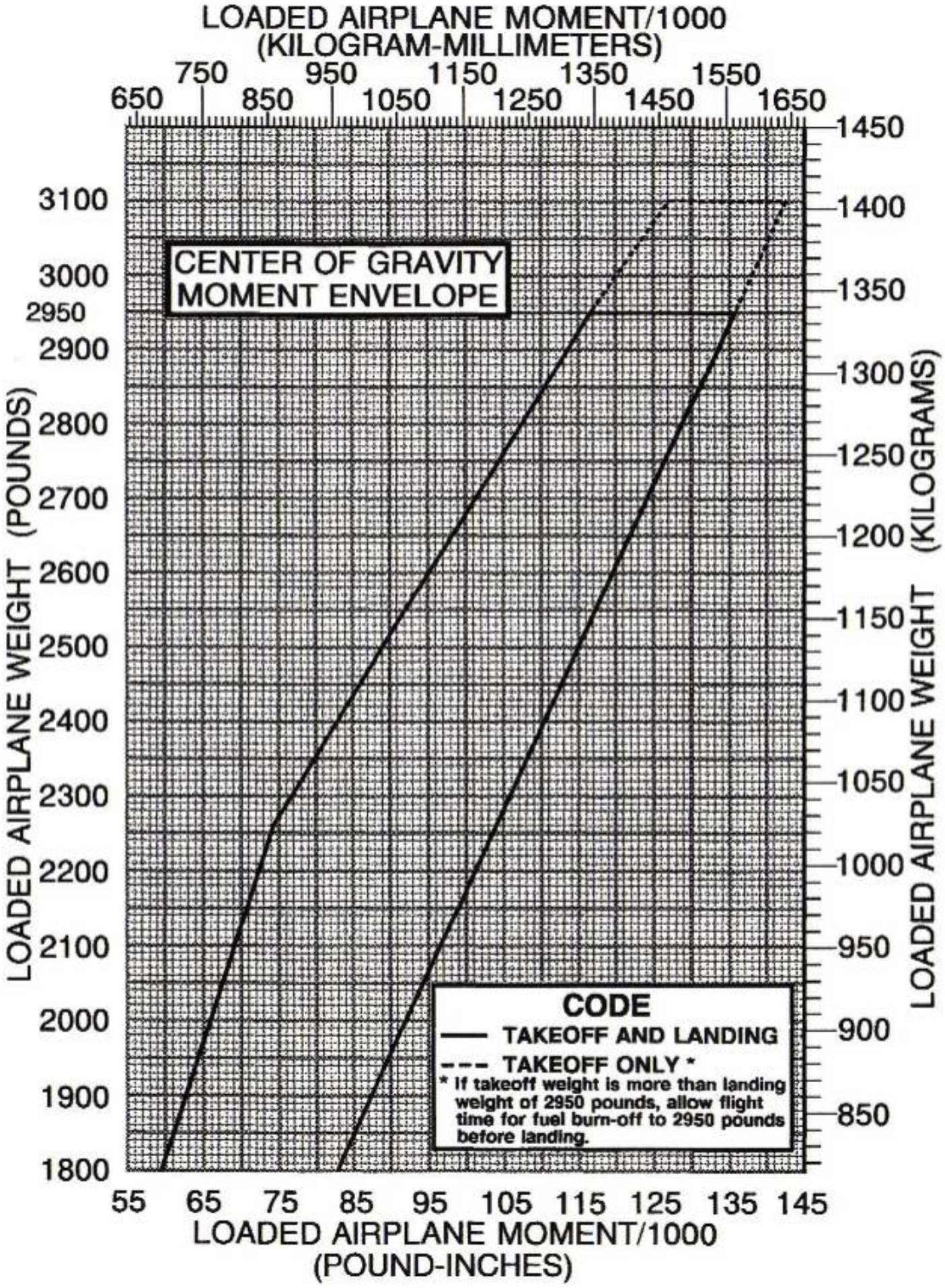
** Arms measured to the center of the areas shown.

NOTES:
1. The usable fuel C.G. arm is located at station 46.5
2. The aft baggage wall (approximate station 134) can be used as a convenenient interior reference point for determining the location of baggage area fuselage stations.

CALCULATING THE MOMENT

The moment is the weight multiplied by the C.G. arm, divided by 1000.

Example: Pilot and front passenger weigh 340lbs, the arm is 37".
Answer: (340 x 37) / 1000 = 12.58


LOADED AIRPLANE MOMENT/1000
(KILOGRAM-MILLIMETERS)
650
750
850
950
1050
1150
1250
1350
1450
1550
1650
CENTER OF GRAVITY
MOMENT ENVELOPE
3100
3000
2950
2900
2800
2700
2600
2500
2400
2300
2200
2100
2000
1900
1800
LOADED AIRPLANE WEIGHT (POUNDS)
1450
1400
1350
1300
1250
1200
1150
1100
1050
1000
950
900
850
LOADED AIRPLANE WEIGHT (KILOGRAMS)
CODE
TAKEOFF AND LANDING
TAKEOFF ONLY *
* If takeoff weight is more than landing weight of 2950 pounds, allow flight time for fuel burn-off to 2950 pounds before landing.
55
65
75
85
95
105
115
125
135
145
LOADED AIRPLANE MOMENT/1000
(POUND-INCHES)

SAMPLE CONFIGURATIONS

Listed in the table below are the maximum passenger/baggage weights for various endurances.

The purpose of this table is to allow you to quickly determine the maximum load permissible on a particular length flight.

WARNING

THIS TABLE IS PROVIDED AS A GUIDE ONLY. THE AEROPLANE NEEDS TO BE LOADED WITHIN THE SPECIFIED CENTRE OF GRAVITY MOMENT ENVELOPE FOUND IN THE APPROVED FLIGHT MANUAL.

MAXIMUM PASSENGER & BAGGAGE WEIGHTS

- 75% cruise power @ 6000 FT - 14.5 gal / 55 litres per hour.
- 45 minute reserve fuel included in flight fuel.
- Taxi fuel not included, add approximately 7 litres.

1.0 Hour Flight

Flight Fuel Required:	25.3 gals / 96.3 litres / 152.5 lbs
Pax / Baggage:	924.7 lbs / 420.3 kg

1.5 Hour Flight

Flight Fuel Required:	32.6 gals / 123.8 litres / 196.0 lbs
Pax / Baggage:	924.7 lbs / 420.3 kg

2.0 Hour Flight

Flight Fuel Required:	39.8 gals / 151.3 litres / 239.6 lbs
Pax / Baggage:	900.4 lbs / 409.3 kg

3.0 Hour Flight

Flight Fuel Required:	54.3 gals / 206.3 litres / 326.7 lbs
Pax / Baggage:	813.3 lbs / 369.7 kg

4.0 Hour Flight

Flight Fuel Required:	68.8 gals / 261.3 litres / 413.8 lbs
Pax / Baggage:	726.2 lbs / 330.1 kg

5.2 Hour Flight

Flight Fuel Required:	86.1 gals / 327.0 litres / 518.0 lbs
Pax / Baggage:	622.0 lbs / 282.7 kg

SHORT FIELD TAKEOFF DISTANCE AT 3100 POUNDS

CONDITIONS:

Flaps 20°
2400 RPM, Full Throttle and Mixture Set Prior to Brake Release
Cowl Flaps Open
Paved, Level, Dry Runway
Zero Wind
Lift Off: 49 KIAS
Speed at 50 Ft: 58 KIAS

Press Alt In Feet	0°C		10°C		20°C		30°C		40°C	
	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst
S. L.	715	1365	765	1460	825	1570	885	1680	945	1800
1000	775	1490	835	1600	900	1720	965	1845	1030	1980
2000	850	1635	915	1760	980	1890	1055	2035	1130	2190
3000	925	1800	995	1940	1070	2090	1150	2255	1235	2435
4000	1015	1990	1090	2150	1175	2325	1260	2515	1355	2720
5000	1110	2210	1195	2395	1290	2595	1385	2820	1485	3070
6000	1220	2470	1315	2690	1415	2930	1520	3200	1635	3510
7000	1340	2785	1445	3045	1560	3345	1675	3685	---	---
8000	1480	3175	1595	3500	1720	3880	---	---	---	---

NOTES:

1. Short field technique as specified in Section 4.
2. Prior to takeoff, the mixture should be leaned to the Maximum Power Fuel Flow placard value in a full throttle, static runup.
3. Decrease distances 10% for each 9 knots headwind. For operation with tail winds up to 10 knots, increase distances by 10% for each 2 knots.
4. For operation on dry, grass runway, increase distances by 15% of the "ground roll" figure.

Note: Section 4 as mentioned above is making reference to the checklist section of this document.

SHORT FIELD LANDING DISTANCE AT 2950 POUNDS

CONDITIONS:

Flaps FULL
Power Off
Maximum Braking
Paved, level, dry runway
Zero Wind
Speed at 50 Ft: 60 KIAS

Press Alt In Feet	0°C		10°C		20°C		30°C		40°C	
	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst
S. L.	560	1300	580	1335	600	1365	620	1400	640	1435
1000	580	1265	600	1365	620	1400	645	1440	665	1475
2000	600	1370	625	1405	645	1440	670	1480	690	1515
3000	625	1410	645	1445	670	1485	695	1525	715	1560
4000	650	1450	670	1485	695	1525	720	1565	740	1600
5000	670	1485	695	1525	720	1565	745	1610	770	1650
6000	700	1530	725	1575	750	1615	775	1660	800	1700
7000	725	1575	750	1615	780	1665	805	1710	830	1750
8000	755	1625	780	1655	810	1715	835	1760	865	1805

NOTES:

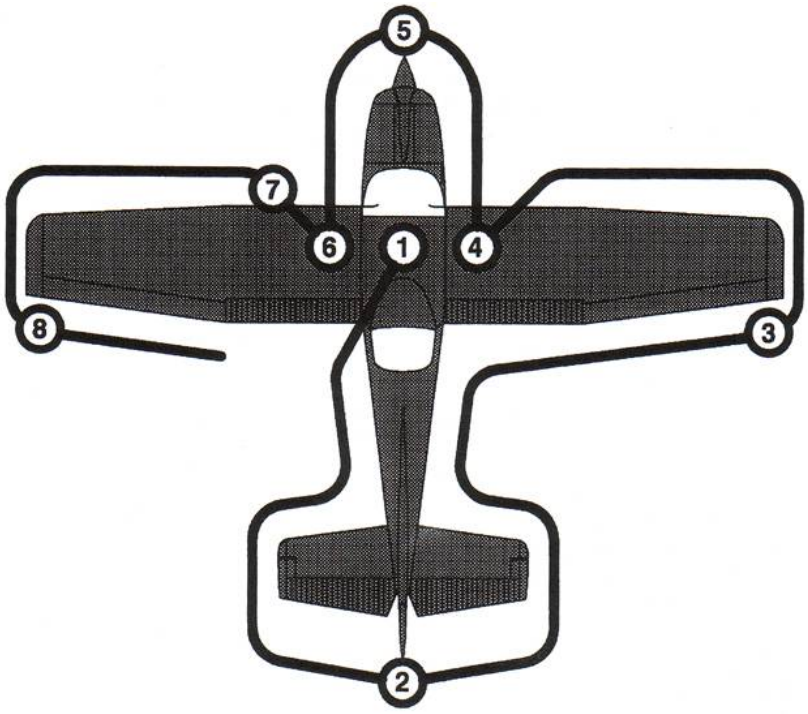
1. Short field technique as specified in Section 4.
2. Decrease distances 10% for each 9 knots headwind. For operation with tail winds up to 10 knots, increase distances by 10% for each 2 knots.
3. For operation on dry, grass runway, increase distances by 45% of the "ground roll" figure.
4. If a landing with flaps up is necessary, increase the approach speed by 10 KIAS and allow for 40% longer distances.

Note: Section 4 as mentioned above is making reference to the checklist section of this document.

Checklists – Normal Operations

PREFLIGHT INSPECTION

Visually check the aeroplane for general condition during walk-around inspection. Aeroplane should be parked in a level ground attitude to ensure that fuel drain valves allow for accurate sampling. Use of the refuelling steps and assist handles will simplify access to the upper wing surfaces for visual checks and refuelling operations. In cold weather, remove even small accumulations of frost, ice or snow from wing, tail and control surfaces. Also, make sure that control surfaces contain no internal accumulations of ice or debris. Prior to flight, check that pitot heater is warm to touch within 30 seconds with battery and pitot heat switches on. If a night flight is planned, check operation of all lights, and make sure a flashlight is available.



(1) CABIN

1. Pitot tube cover -- REMOVE, check for pitot blockage.
2. Pilots Operating Handbook -- available in aeroplane
3. Aeroplane weight and balance -- CHECKED.
4. Parking brake -- SET.
5. Control Wheel Lock -- REMOVE.
6. Ignition Switch -- OFF.
7. Avionics Master Switch -- OFF.

WARNING

WHEN TURNING ON THE MASTER SWITCH, USING AN EXTERNAL POWER SOURCE, OR PULLING THE PROPELLER THROUGH BY HAND, TREAT THE PROPELLER AS IF THE IGNITION SWITCH WERE ON. DO NOT STAND, NOR ALLOW ANYONE ELSE TO STAND, WITHIN THE ARC OF THE PROPELLER, SINCE A LOOSE OR BROKEN WIRE OR A COMPONENT MALFUNCTION COULD CAUSE THE PROPELLER TO ROTATE.

8. Master Switch -- ON.
9. Fuel Quantity Indicators – CHECK QUANTITY and ENSURE LOW FUEL ANNUNCIATORS (L LOW FUEL R) ARE EXTINGUISHED.
10. Avionics Master Switch -- ON.
11. Avionics Cooling Fan -- CHECK AUDIBLY FOR OPERATION.
12. Avionics Master Switch -- OFF.
13. Static Pressure Alternate Source Valve -- OFF.
14. Annunciator Panel Test Switch -- PLACE AND HOLD IN TST POSITION and ensure all amber and red annunciators illuminate.
15. Annunciator Panel Test Switch -- RELEASE. Check that appropriate annunciators remain on.

NOTE

When Master Switch is turned ON, some annunciators will flash for approximately 10 seconds before illuminating steadily. When panel TST switch is toggled up and held in position, all remaining lights will flash until the switch is released

16. Fuel Selector Valve -- BOTH.
17. Flaps -- EXTEND.
18. Pitot Heat -- ON (Carefully check that pitot tube is warm to touch within 30 seconds.)
19. Pitot Heat -- OFF.
20. Master Switch -- OFF.
21. Baggage door -- CHECK, Lock with key.

(2) EMPENNAGE

1. Rudder Gust Lock -- REMOVE.
2. Tail Tie-down -- DISCONNECT.
3. Control Surfaces -- CHECK freedom of movement and security.
4. Trim Tab -- CHECK security.
5. Antennas -- CHECK for security of attachment and general condition.

(3) RIGHT WING Trailing Edge

1. Flap -- CHECK for security and condition.
2. Aileron -- CHECK freedom of movement and security.

(4) RIGHT WING

1. Wing Tie-down -- DISCONNECT.
2. Fuel Tank Vent Opening -- CHECK for stoppage.
3. Main Wheel Tire -- CHECK for proper inflation and general condition (weather checks, tread depth, and wear etc).

WARNING

IF, AFTER REPEATED SAMPLING, EVIDENCE OF CONTAMINATION STILL EXISTS, THE AEROPLANE SHOULD NOT BE FLOWN. TANKS SHOULD BE DRAINED AND SYSTEM PURGED BY QUALIFIED MAINENANCE PERSONNEL. ALL EVIDENCE OF CONTAMINATION MUST BE REMOVED BEFORE FURTHER FLIGHT.

4. Fuel Tank Sump Quick Drain Valves -- DRAIN at least a cupful of fuel (using sampler cup) from each sump location to check for water, sediment, and proper fuel grade before each flight and after each refuelling. If water is observed, take further samples until clear and then gently rock wings and lower tail to the ground to move any additional contaminants to the sampling points. Take repeated samples from all fuel drain points until all contamination has been removed. If contaminants are still present, refer to above WARNING and do not fly aeroplane.
5. Fuel quantity -- CHECK VISUALLY for desired level.
6. Fuel Filler Cap -- SECURE AND VENT UNOBSTRUCTED.

(5) NOSE

1. Right Static Source Opening – CHECK for blockage.
2. Fuel Selector Quick Drain Valve (located on bottom of fuselage below the fuel selector valve) -- DRAIN at least a cupful of fuel (using sampler cup) from valve to check for water, sediment, and proper fuel grade before each flight and after each refuelling. If water is observed, take further samples until clear and then gently rock wings and lower tail to the ground to move any additional contaminants to the sampling points. Take repeated samples from all fuel drain points until all contamination has been removed. If contaminants are still present, refer to WARNING above and do not fly aeroplane.

3. Engine Oil Dipstick/Filler Cap -- CHECK oil level, than check dipstick/filler cap SECURE. Do not operate with less than four quarts. Fill to nine quarts for extended flights.
4. Engine Cooling Air Inlets -- CLEAR of obstructions.
5. Propeller and spinner -- CHECK for nicks and security.
6. Air Filter- CHECK for restrictions by dust or other foreign matter.
7. Nose Wheel Strut and Tyre -- CHECK for proper inflation of strut and general condition (weather checks, tread depth and wear, etc….) of tire.
8. Left Static Source Opening -- CHECK for blockage.

(6) LEFT WING

1. Fuel Quantity -- CHECK VISUALLY for desired level.
2. Fuel Filler Cap -- SECURE AND VENT UNOBSTRUCTED.
3. Fuel Tank Sump Quick Drain Valves -- DRAIN at least a cupful of fuel (using a sampler cup) from each sump location to check for water, sediment and proper fuel grade before each flight and after each refuelling. If water is observed, take further samples until clear and then gently rock wings and lower tail to the ground to move any additional contaminants to the sampling points. Take repeated samples from all fuel drain points until all contamination has been removed. If contaminants are still present do not fly aeroplane.
4. Main Wheel Tyre -- CHECK for proper inflation and general condition (weather checks, tread depth and wear, etc).

(7) LEFT WING Leading Edge

1. Pitot Tube Cover -- REMOVE and check opening for blockage.
2. Fuel Tank Vent Opening -- CHECK for blockage.
3. Stall Warning System -- CHECK vane for freedom of movement. To check the system, place the vane upward; a sound from the warning horn with the Master Switch ON will confirm system operation.
4. Wing Tie-Down -- DISCONNECT.
5. Landing/Taxi Lights -- CHECK for condition and cleanliness of cover.

(8) LEFT WING Trailing edge

1. Aileron -- CHECK for freedom of movement and security.
2. Flap -- CHECK for security and condition.

BEFORE STARTING ENGINE

1. Pre-flight Inspection -- COMPLETE.
2. Passenger Briefing -- COMPLETE.
3. Seats, Seatbelts, Shoulder Harnesses -- ADJUST and LOCK. Ensure inertia reel locking.
4. Brakes -- TEST and PARKING BRAKE SET.
5. Circuit Breakers -- CHECK IN.
6. Electrical Equipment -- OFF.

WARNING

THE AVIONICS MASTER SWITCH MUST BE OFF DURING ENGINE START TO PREVENT POSSIBLE DAMAGE TO AVIONICS.

7. Avionics Master Switch -- OFF.
8. Autopilot (if installed) -- OFF.
9. Cowl Flaps -- OPEN.
10. Fuel Selector Valve -- BOTH.

STARTING ENGINE (With Battery)

1. Throttle -- OPEN ¼ INCH (5mm).
2. Propeller -- HIGH RPM (Fully in).
3. Mixture -- IDLE CUT OFF.
4. Propeller Area -- CLEAR.
5. Master Switch -- ON

NOTE

If engine is warm omit priming procedure in steps 6, 7 & 8.

6. Auxiliary Fuel Pump Switch -- ON.
7. Mixture - ADVANCE to full rich for 3 to 4 seconds, then return to IDLE CUT OFF position.
8. Auxiliary Fuel Pump -- OFF.
9. Confirm area around aircraft is clear -- call “CLEAR PROP!”
10. Ignition Switch -- START (release when engine starts).
11. Mixture -- ADVANCE smoothly to RICH when engine fires.
12. Set throttle -- 1000 RPM.

NOTE

If engine floods, turn off auxiliary fuel pump, place mixture in idle cut off, open throttle ½ to full, and crank engine. When engine fires, advance mixture to full rich and retard throttle promptly

13. Oil Pressure -- CHECK. Confirm rising within 30 seconds or shut down.
14. AMPS/VOLTS -- Check for discharge.
15. Navigation lights and Flashing Beacon -- ON as required.
16. Avionics Master Switch -- ON
17. Radios/Navaids -- ON. Set as required
18. Flaps -- RETRACT.

STARTING ENGINE (With External Power)

Procedures for starting the engine with external power are similar to starting with battery power.

Insert two additional steps to the STARTING ENGINE (with battery) checklist:

4.1 External Power -- CONNECT to Aeroplane receptacle.
13.1 External Power -- DISCONNECT from aeroplane receptacle.

TAXYING

1. Brakes -- CHECK.
2. Instruments -- CHECK indications in correct sense.

BEFORE TAKEOFF

1. Parking Brake -- SET.
2. Passenger Seat Backs -- MOST UPRIGHT POSITION .
3. Seats, Seatbelts and Shoulder Harnesses -- CHECK SECURE.
4. Cabin Doors -- CLOSED and LOCKED.
5. Flight Controls -- FULL FREE and CORRECT movement.
6. Flight Instruments -- CHECK and SET.
7. Fuel Quantity -- CHECK.
8. Mixture -- RICH.
9. Fuel Selector Valve -- RECHECK BOTH.
10. Elevator Trim and Rudder Trim -- SET for takeoff.
11. Throttle -- 1800 RPM.
    a. Magnetos -- CHECK. RPM drop should not exceed 150 RPM on either magneto or 50 RPM differential between Magnetos. Confirm on BOTH.
    b. Propeller -- CYCLE from high to low RPM; return to high RPM. Repeat. Confirm in high RPM.
    c. Vacuum Gauge -- CHECK.
    d. Engine Instruments and Ammeter -- CHECK.
12. Annunciator Panel -- Ensure no Annunciators are illuminated.
13. Throttle -- 800-1000 RPM.
14. Throttle Friction Lock -- ADJUST.
15. Strobe Lights -- AS DESIRED.
16. Radios and Avionics -- SET.
17. Autopilot -- OFF.
18. Wing Flaps -- SET for take-off (0º - 20º).
19. Cowl Flaps -- OPEN.
20. Brakes -- RELEASE.

HOLDING POINT CHECKS

1. LIGHTS -- Turn on as required.
2. TRANSPONDER -- 1200 ALT or as required.
3. RADIO -- Frequency set, volume tested, clearance.

TAKEOFF

NORMAL TAKEOFF

1. Wing Flaps -- 0º.
2. Power -- FULL THROTTLE and 2400 RPM.
3. Mixture -- RICH (mixture may be leaned to Maximum Power Fuel Flow placard value).
4. Checks -- REVS/MAP achieved, AIRSPEED rising, GUAGES in the green.
5. Elevator Control -- LIFT NOSE WHEEL at 50-60 KIAS.
6. Climb Speed -- 80 KIAS.
7. Wing Flaps -- RETRACT.

SHORT FIELD TAKEOFF

1. Wing Flaps -- 20º.
2. Foot Brakes -- APPLY.
3. Power -- FULL THROTTLE and 2400RPM.
4. Mixture -- Lean to obtain Maximum Power Fuel Flow placard value.
5. Brakes -- RELEASE.
6. Checks -- REVS/MAP achieved, AIRSPEED rising, GUAGES in the green.
7. Elevator Control -- MAINTAIN SLIGHTLY TAIL LOW ATTITUDE.
8. Climb Speed -- 58 KIAS (Until all obstacles are cleared).
9. Wing Flaps -- RETRACT slowly after reaching 70 KIAS.

ENROUTE CLIMB

NORMAL CLIMB

1. Airspeed -- 85-95 KIAS.
2. Power -- 23in Hg or FULL THROTTLE, whichever is less, and 2400 RPM.
3. Mixture -- 15 GPH or FULL RICH (whichever is less).
4. Cowl Flaps -- OPEN as required.
5. Fuel Selector Valve -- BOTH.

MAXIMUM PERFORMANCE CLIMB

1. Airspeed -- 80 KIAS at sea level to 72 KIAS at 10000 feet.
2. Power -- FULL THROTTLE and 2400 RPM.
3. Mixture -- lean in accordance with Maximum Power Fuel Flow placard.
4. Cowl Flaps -- OPEN as required.
5. Fuel Selector Valve -- BOTH.

CRUISE

1. Power -- 15-23 in. Hg, 2000-2400 RPM (No more than 80%).
2. Rudder and Elevator Trim -- ADJUST.
3. Mixture -- LEAN.
4. Cowl Flaps -- CLOSE.

DESCENT

1. Power -- AS DESIRED.
2. Mixture -- ENRICHEN as required.
3. Cowl Flaps -- CLOSED.
4. Fuel Selector Valve -- BOTH.
5. Wing Flaps -- AS DESIRED (0º-10º below 140 KIAS; 10º-20º below 120 KIAS; 20º-30° below 100 KIAS)

BEFORE LANDING

1. Brakes -- Checked and OFF.
2. Undercarriage -- DOWN and locked.
3. Mixture -- RICH.
4. Propeller -- HIGH RPM.
5. Fuel -- Check quantity, pressure and selection.
6. Auxiliary Fuel Pump -- OFF.
7. Landing/Taxi Lights -- ON.
8. Autopilot -- OFF.
9. Seat Backs -- MOST UPRIGHT POSITION.
10. Windows, Seats and Seatbelts -- SECURED and LOCKED.

LANDING

NORMAL LANDING

1. Airspeed -- 70-80 KIAS (Flaps UP).
2. Wing Flaps -- AS DESIRED (0º-10º below 140 KIAS; 10º-20º below 120 KIAS; 20º-30° below 100 KIAS).
3. Airspeed -- 60-70 KIAS (flaps FULL).
4. Power -- REDUCE to idle as obstacle is cleared.
5. Trim -- ADJUST as desired.
6. Touchdown -- MAIN WHEELS FIRST.
7. Landing Roll -- LOWER NOSE WHEEL GENTLY.
8. Braking -- MINIMUM REQUIRED.

SHORT FIELD LANDING

1. Airspeed -- 70-80 KIAS (Flaps UP).
2. Wing Flaps -- FULL (below 100 KIAS).
3. Airspeed -- 60 KIAS (Until flare).
4. Trim -- ADJUST as desired.
5. Touchdown -- MAIN WHEELS FIRST.
6. Brakes -- APPLY HEAVILY.
7. Wing Flaps -- RETRACT for maximum brake effectiveness.

BALKED LANDING

1. Power -- FULL THROTTLE and 2400 RPM.
2. Wing Flaps -- RETRACT to 20º.
3. Climb Speed -- 55 KIAS.
4. Wing Flaps -- RETRACT slowly after reaching a safe altitude and 70 KIAS.
5. Cowl Flaps -- OPEN.

AFTER LANDING

1. Wing Flaps -- “Identified”, then RETRACT.
2. Cowl Flaps -- OPEN.
3. Pitot Heat -- OFF.
4. Radios/Navaids -- AS REQUIRED.
5. Landing/Taxi/Strobe Lights -- OFF/AS REQUIRED.

SHUT DOWN/SECURING AEROPLANE

1. Parking Brake -- SET (if required).
2. Throttle -- 1000 RPM.
3. Ignition Switches -- CHECK L, R, then ON BOTH.
4. GPS -- OFF.
5. Electrical equipment, Avionics Master Switch, Autopilot – OFF.
6. Mixture -- IDLE CUT OFF (pulled fully out).
7. Throttle -- CLOSED (Once propeller has stopped).
8. Ignition Switches -- OFF.
9. Master Switch -- OFF .
10. Control Lock -- INSTALL.
11. Fuel Selector Valve -- BOTH.
12. Tidy aeroplane interior.
13. Pitot Cover -- INSTALL.

Checklists – Emergency Procedures

INTRODUCTION

Emergencies caused by aeroplane or engine malfunctions are extremely rate if proper pre-flight inspections and maintenance are performed.

Section 3 of the approved flight manual provides amplified procedures for coping with emergencies that may occur.

Should an emergency arise the basic guidelines described in this section and the approved flight manual should be considered and applied as necessary to correct the problem.

Procedures in this section shown in **bold faced** type are immediate action items that should be committed to memory.

AIRSPEEDS

AIRSPEEDS FOR EMERGENCY OPERATION

Engine Failure After Takeoff:
- Wing Flaps Up ..... 75 KIAS
- Wing Flaps Down ..... 70 KIAS

Manoeuvring Speed:
- 3100 Lbs..... 110 KIAS
- 2600 Lbs..... 101 KIAS
- 2000 Lbs..... 88 KIAS

Maximum Glide:
- 3100 Lbs..... 75 KIAS
- 2600 Lbs..... 70 KIAS
- 2000 Lbs..... 62 KIAS

Precautionary Landing With Engine Power ..... 70 KIAS

Landing Without Engine Power:
- Wing Flaps Up ..... 75 KIAS
- Wing Flaps Down ..... 70 KIAS

ENGINE FAILURES

ENGINE FAILURE DURING TAKEOFF ROLL

1. **Throttle -- IDLE.**
2. **Brakes -- APPLY.**
3. Wing Flaps -- RETRACT.
4. Mixture -- IDLE CUT OFF.
5. Ignition Switch -- OFF.
6. Master Switch -- OFF.

ENGINE FAILURE IMMEDIATELY AFTER TAKEOFF

1. **Airspeed -- 75 KIAS Flaps Up, 70 KIAS Flaps Down.**
2. Mixture -- IDLE CUT OFF.
3. Fuel Selector Valve -- PUSH DOWN and ROTATE TO OFF.
4. Ignition Switch -- OFF.
5. Wing Flaps -- AS REQUIRED (FULL recommended).
6. Master Switch -- OFF.
7. Cabin Door -- UNLATCH.
8. Land -- STRAIGHT AHEAD.

ENGINE FAILURE DURING FLIGHT (Restart Procedures)

1. **Airspeed -- 75 KIAS (Best glide speed).**
2. **Fuel Selector Valve -- BOTH.**
3. **Auxiliary Fuel Pump Switch -- ON.**
4. **Mixture -- RICH (if restart has not occurred).**
5. Ignition Switch -- BOTH (or START if propeller is stopped).

FORCED LANDINGS

EMERGENCY LANDING WITHOUT ENGINE POWER

1. Passenger Seat Backs -- MOST UPRIGHT POSITION.
2. Seats and Seat Belts -- SECURE.
3. Airspeed -- 75 KIAS Flaps Up, 70 KIAS Flaps Down.
4. Mixture -- IDLE CUT OFF.
5. Fuel Selector Valve -- PUSH DOWN and ROTATE TO OFF.
6. Ignition Switch -- OFF.
7. Wing Flaps -- AS REQUIRED (FULL recommended).
8. Master Switch -- OFF (when landing is assured).

9. Doors -- UNLATCH PRIOR TO TOUCHDOWN.
10. Touchdown -- SLIGHTLY TAIL LOW.
11. Brakes -- APPLY HEAVILY.

PRECAUTIONARY LANDING WITH ENGINE POWER

1. Passenger Seat Backs -- MOST UPRIGHT POSITION.
2. Seats and Seat Belts -- SECURE.
3. Airspeed -- 75 KIAS
4. Wing Flaps -- 20°
5. Selected Field -- FLY OVER, noting terrain and obstructions, then retract flaps upon reaching a safe altitude and airspeed.
6. Avionics Master Switch and Electrical Switches – OFF.
7. Wing Flaps -- FULL (on final approach).
8. Airspeed -- 70 KIAS.
9. Master Switch -- OFF.
10. Doors -- UNLATCH PRIOR TO TOUCHDOWN.
11. Touchdown -- SLIGHTLY TAIL LOW.
12. Ignition Switch -- OFF.
13. Brakes -- APPLY HEAVILY.

DITCHING

1. Radio -- TRANSMIT MAYDAY on 121.5 MHz or appropriate frequency, giving location and intentions and SQUAWK 7700.
2. Heavy Objects in baggage area -- SECURE OR JETTISON (if possible).
3. Passenger Seat Backs -- MOST UPRIGHT POSITION.
4. Seats and Seat Belts -- SECURE.
5. Wing Flaps -- 20° to FULL.
6. Power -- ESTABLISH 300FT/MIN DESCENT AT 65 KIAS.

NOTE
If no power is available, approach at 70 KIAS
with flaps up or at 65 KIAS with 10° flaps.

7. Approach -- High Winds, Heavy Seas – INTO THE WIND.
   Light Winds, Heavy Swells – PARALLEL TO SWELLS.
8. Cabin Doors -- UNLATCH.
9. Touchdown -- LEVEL ATTITUDE AT ESTABLISHED RATE OF DESCENT.
10. Face -- CUSHION at touchdown with folded coat.
11. ELT -- Activate.
12. Aeroplane -- EVACUATE through cabin doors. If necessary open window and flood cabin to equalize pressure so doors can be opened.
13. Life Vests and Raft -- INFLAT WHEN CLEAR OF AEROPLANE.

FIRES

DURING START ON GROUND

1. **Cracking -- CONTINUE** to get a start which would suck the flames and accumulated fuel into the engine.

If engine starts:

2. Power -- 1700 RPM for a few minutes.
3. Engine -- Shutdown and inspect for damage.

If engine fails to start:

4. **Throttle -- FULL OPEN.**
5. **Mixture -- IDLE CUT OFF.**
6. **Cranking -- CONTINUE.**
7. **Fuel Selector Valve -- PUSH DOWN and ROTATE TO OFF.**
8. **Auxiliary Fuel Pump -- OFF.**
9. Fire Extinguisher -- OBTAIN.
10. Engine -- Master Switch OFF, Ignition Switch OFF.
11. Parking Brake -- RELEASE.
12. Aeroplane -- EVACUATE.
13. Fire -- EXTINGUISH using fire extinguisher, wool blanket or dirt.
14. Fire Damage -- INSPECT, repair damage or replace damaged components or wiring before conducting another flight.

ENGINE FIRE IN FLIGHT

1. **Mixture -- IDLE CUT OFF.**
2. **Fuel Selector Valve -- PUSH DOWN and ROTATE TO OFF.**
3. **Auxiliary Fuel Pump Switch -- OFF.**
4. **Master Switch -- OFF.**
5. Cabin Heat and Air -- OFF (except overhead vents).
6. Airspeed -- 100 KIAS (If fire is not extinguished, increase glide speed to find an airspeed – within airspeed limitations – which will provide an incombustible mixture).
7. Forced Landing -- EXECUTE (as described in Emergency Landing Without Engine Power).

ELECTRICAL FIRE IN FLIGHT

1. **Master Switch -- OFF.**
2. **Vents, Cabin Air, Heat -- CLOSED.**
3. **Fire Extinguisher -- ACTIVATE.**
4. Avionics Master Switch -- OFF.
5. All other Switches (except ignition switch) -- OFF.

WARNING

AFTER DISCHARGING FIRE EXTINGUISHER AND ASCERTAINING THAT THE FIRE HAS BEEN EXTINGUISHED, VENTILATE CABIN.

6. Vents, Cabin Air, Heat -- OPEN when it is ascertained that fire is completely extinguished.

If fire has been extinguished and electrical power is necessary for continuance of flight to the nearest suitable airport or landing area:

7. Master Switch -- ON.
8. Circuit Breakers -- CHECK for faulty circuit, do not reset.
9. Radio Switches -- OFF.
10. Avionics Master Switch -- ON.
11. Radio/Electrical Switches -- ON one at a time, with delay after each until short circuit is localised.

CABIN FIRE

1. **Master Switch -- OFF.**
2. **Vents, Cabin Air, Heat -- CLOSED (to avoid drafts).**
3. **Fire Extinguisher -- ACTIVATE.**

WARNING

AFTER DISCHARGING FIRE EXTINGUISHER AND ASCERTAINING THAT THE FIRE HAS BEEN EXTINGUISHED, VENTILATE CABIN.

4. Vents, Cabin Air, Heat -- OPEN when it is ascertained that fire is completely extinguished.
5. Land the aeroplane as soon as possible to inspect for damage.

WING FIRE

1. **Landing/Taxi/Strobe/Navigation Light Switches -- OFF.**
2. **Pitot Heat Switch -- OFF.**
3. Sideslip to keep flames away from cabin and fuel tank.
4. Land as soon as possible using flaps only on final approach.

ICING

INADVERTENT ICING ENCOUNTER

1. **Turn pitot heat switch ON.**
2. **Turn back or change altitude** to obtain an outside air temperature that is less conductive to icing.
3. **Pull cabin heat full out and rotate defroster control clockwise** to obtain maximum defroster airflow.
4. Increase engine speed to minimize ice build-up on propeller blades.
5. Watch for signs of induction air filter icing. An unexplained loss of manifold pressure could be caused by ice blocking the air intake filter. Adjust the throttle as desired to set manifold pressure. Adjust mixture, as required for any change in power settings.
6. Plan a landing at the nearest airport. With an extremely rapid ice build up, select a suitable “off airport” landing site.
7. With an ice accumulation of ¼ inch or more on the wing leading edges, be prepared for significantly higher stall speed.
8. Leave wing flaps retracted. With a severe ice build up on the horizontal tail, the change in wing wake airflow direction caused by wing flap extension could result in a loss of elevator effectiveness.
9. Open left window and, if practical, scrape ice from a portion of the windshield for visibility in the landing approach.
10. Perform a landing approach using a forward slip, if necessary, for improved visibility.
11. Approach at 80 to 90 KIAS depending upon the amount of the accumulation.
12. Perform a landing in a level attitude.

STATIC SOURCE BLOCKAGE
(Erroneous Instrument Readings Suspected)

1. **Static Pressure Alternate Source Valve -- PULL ON.**
2. Airspeed/Altitude -- See Flight Manual (Section 5) for correction table.

VACUUM SYSTEM FAILURE

Left or Right Vacuum Annunciator Light illuminates.

1. **Vacuum Gauge – CHECK** to ensure vacuum within green arc.

If vacuum is not within normal operating limits a failure has occurred in the vacuum system and partial panel procedures may be required for continued flight.

LANDING WITH A FLAT MAIN TIRE

1. Approach -- NORMAL.
2. Wing Flaps -- FULL DOWN.
3. Touchdown -- GOOD MAIN TIRE FIRST, hold aeroplane off flat tire as long as possible with aileron control.
4. Directional Control -- MAINTAIN using brake on good wheel as required.

LANDING WITH A FLAT NOSE TIRE

1. Approach -- NORMAL.
2. Wing Flaps -- As required.
3. Touchdown -- ON MAINS, hold nose wheel off the ground as long as possible.
4. When nose wheel touches down, maintain full up elevator as aeroplane slows to stop.

ELECTRICAL POWER SUPPLY SYSTEM MALFUNCTIONS

AMMETER SHOWS EXCESSIVE RATE OF CHARGE (Full Scale Deflection)

1. Alternator -- OFF.
2. Nonessential Electrical Equipment -- OFF.
3. Flight -- TERMINATE as soon as practical.

LOW VOLTAGE ANNUNCIATOR ILLUMINATES DURING FLIGHT (Ammeter Indicates Discharge)

1. Avionics Master Switch -- OFF.
2. Alternator Circuit Breaker -- CHECK IN.
3. Master Switch -- OFF (both sides)
4. Master Switch -- ON.
5. Low Voltage Annunciator -- CHECK OFF.
6. Avionics Master Switch -- ON.

If low voltage light illuminates again:

7. Alternator -- OFF.
8. Nonessential Radio and Electrical Equipment -- OFF.
9. Flight -- TERMINATE as soon as practical.

Notes

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